The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARK A. LAUER

Appeal No. 2006-2926
Application No. 09/912,723

ON BRIEF

Before KRASS, JERRY SMITH, and HOMERE, Administrative Patent Judges.

JERRY SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's rejection of claims 1, 2, 4, 6-12, 14, 17-21, 24, and 27.[1] Claims 3, 13, 22, 25, and 28 have been indicated to contain allowable subject matter [answer, page 47; reply brief, page 19].

The disclosed invention pertains to an electromagnetic head for a disk drive that is positioned by an actuator. Specifically, the invention forms the head,

[1] Although arguments pertaining to claims 23, 26, and 29 were included in the appeal brief [see e.g., brief, pages 3 and 4], the claims were later cancelled in an amendment filed Feb. 28, 2006 that was entered by the examiner [answer, page 3].

flexure, gimbal, and actuator elements on and from the same wafer substrate. In one embodiment, a piezoelectric actuator attached to the substrate is employed.

Representative claim 1 is reproduced as follows:

1. A device for reading or writing information, the device comprising:
an electromagnetic transducer including a plurality of solid transducer layers,
a substrate adjoining said transducer, said substrate shaped as a rigid body adjacent to said transducer and as a plurality of flexible elements distal to said transducer, and
an actuator attached to said substrate distal to said transducer.

The examiner relies on the following references:

Tokuyama et al. (Tokuyama)	5,757,573	May 26, 1998
Fukuoka (Japan)	JP 09-148639 A	June 6, 1997
Harada et al. (Harada) (Japan)	JP 09-035230 A	Feb. 2, 1997
Endo (Japan)	JP 06-176517 A	June 24, 1994

Piezoelectric Actuator for Small Hard Disk Drive, IBM Tech. Discl. Bull., Feb. 1993 ("IBM").

The following rejections are on appeal before us:

1. Claims 1, 7-10, 20, 21, and 27 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Harada.

2. Claims 2, 4, 11, 12, 14, 17, 19, and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of IBM.

3. Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of Endo.

4. Claim 18 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of IBM and further in view of Fukuoka.

5. Claims 21 and 27 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Tokuyama.

Rather than repeat the arguments of appellant or the examiner, we make reference to the briefs and the answer for the respective details thereof.

OPINION

We have carefully considered the subject matter on appeal, the rejections advanced by the examiner and the evidence of anticipation and obviousness relied upon by the examiner as support for the rejections. We have, likewise, reviewed and taken into consideration, in reaching our decision, the appellant's arguments set forth in the briefs along with the examiner's rationale in support of the rejections and arguments in rebuttal set forth in the examiner's answer.

It is our view, after consideration of the record before us, that the disclosure of Harada fully meets the invention as set forth in claims 1, 7-10, and 21. We reach the opposite conclusion, however, with respect to claims 20 and 27. We further conclude that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in claims 2, 4, 11, 12, 14, 17-19, and 24.

We reach the opposite conclusion, however, with respect to claim 6. Lastly, we hold that the disclosure of Tokuyama does not fully meet the invention set forth in claims 1, 20, 21, and 27. Accordingly, we affirm-in-part.

Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. RCA Corp. v. Applied Digital Data Systems, Inc., 730 F.2d 1440, 1444, 221 USPQ 385, 388 (Fed. Cir. 1984); W.L. Gore and Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1554, 220 USPQ 303, 313 (Fed. Cir. 1983). Only those arguments actually made by appellant have been considered in this decision. Arguments which appellant could have made but chose not to make in the briefs have not been considered and are deemed to be waived [see 37 CFR § 41.37(c)(1)(vii)(2004)].

The examiner has indicated how the claimed invention is deemed to be fully met by the disclosure of Harada [answer, pages 6-8]. Appellant first argues that Harada is non-enabled and therefore fails to qualify as an anticipatory prior art reference [brief, page 16].[2] To support this contention, appellant argues that the skilled artisan would have expected the thin film magnetic head 1 to have

[2] Although appellant challenges the adequacy of the computer-generated English translation of Harada [see e.g., brief, pages 16 and 17], the examiner nevertheless obtained an official English translation of the document from the USPTO. We rely exclusively on the official translation as it is the single best English-language source available on this record in discerning the content of Harada. See MPEP § 706.02(I) ("Prior art rejections should ordinarily be confined strictly to the best available art."). See also MPEP § 706.02(II) (requiring examiners to obtain translations of foreign documents so that the record is clear as to the precise facts the examiner is relying upon in support of a rejection). Accordingly, all arguments regarding the computer-generated translation are moot in view of our sole reliance on the official translation.

"curled up like a potato chip" when removed from its underlying substrate due to differences in expansion and contraction of the different material layers of the head 1 [reply brief, page 6]. Appellant also alleges that it is impossible to reconcile Fig. 2 of Harada with Figs. 4 and 5 due to the existence of a space between gimbal 3 and slider 2. In this regard, appellant contends that Figs. 4 and 5 show such a space, but Fig. 2 shows the gimbal connected to the slider [brief, page 18; reply brief, page 18].

Throughout the briefs, appellant also refers to various aspects of the electric wiring 4 of Harada that allegedly render the reference non-enabling. Specifically, appellant contends that Harada fails to teach (1) how the wirings and slider of Fig. 9 would be purified to allow surface-activated bonding to occur, and (2) how to overcome strain between the metal wirings and the head 1 [reply brief, page 12]. Appellant also contends that signal errors would result from connecting electric wiring with the actuator [brief, page 19].

We recognize that a claimed invention cannot be anticipated by a prior art reference if the allegedly anticipatory reference is not enabled. Amgen, Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1354, 65 USPQ2d 1385, 1416 (Fed. Cir. 2003). But a presumption exists that the relevant disclosures of a prior art reference are enabled. Id. at 1355, 65 USPQ2d at 1416.[3] Accordingly, the burden then shifts to appellant to prove otherwise by a preponderance of the evidence. Id.

[3] See also MPEP § 2121.

On this record, appellant has hardly met his burden of rebutting the presumption of enablement of the Harada reference. On the contrary, appellant's assertions are merely speculative with no concrete evidentiary support apart from conclusory opinions regarding the apparatus' operability. It is well settled that mere lawyer's arguments and conclusory statements, which are unsupported by factual evidence, are entitled to little probative value. In re Geisler, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); In re De Blauwe, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); In re Wood, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978); In re Lindner, 457 F.2d 506, 508-09, 173 USPQ 356, 358 (CCPA 1972).

Even assuming, for the sake of argument, that the relevant disclosures of Harada somehow did not satisfy the enablement standard of 35 U.S.C. § 112, the standard for what constitutes proper enablement of a prior art reference for purposes of anticipation under § 102 differs markedly from the enablement standard under § 112. Rasmusson v. Smithkline Beecham Corp., 413 F.3d 1318, 1325-26, 75 USPQ2d 1297, 1302 (Fed. Cir. 2005). Although we find each of appellant's contentions regarding the enablement of Harada speculative and therefore unpersuasive, we note in passing that the skilled artisan would certainly have sufficient disclosure to make or use the structures depicted in the figures without undue experimentation. In our view, the disclosure of Harada is enabling even under the more stringent standard of § 112.

Turning to the merits of the rejection, appellant first argues with respect to independent claim 1 that ¶ 0029 of Harada does not describe plural layers of magnetoresistive head contrary to the examiner's assertion [brief, pages 18 and 19]. In response, the examiner refers to Harada's teaching in ¶ 0029 of providing a composite head comprising an electromagnetic induction head and a magnetoresistive effect head [answer, page 16].

Appellant also argues that Harada does not disclose an actuator that is attached to the substrate as claimed [brief, page 19; reply brief, page 7]. According to appellant, Harada's arm 5 does not extend to connect with actuator 7, and even if it did, arm 5 is not connected to substrate 2 [brief, page 19].

The examiner responds that Harada discloses a conventional voice-coil motor positioning actuator [answer, page 17]. According to the examiner, the skilled artisan would recognize that the magnets of this actuator must be affixed to the arm for the actuator to move at all [answer, pages 17 and 18]. Appellant responds by noting that if the coil is affixed to the actuator, one would expect current to be induced in the electric wirings 4 thus causing errors in reading and writing by the head 1 [reply brief, pages 6 and 7].

We will sustain the examiner's rejection of independent claim 1. Although we find the examiner's reliance on ¶ 0029 of Harada problematic as evidentiary support for multiple layers of the electromagnetic transducer as claimed, we

nevertheless find that Harada amply discloses this limitation in Fig. 3.[4] In that figure, electromagnetic induction head contains a number of layers -- labeled and unlabeled -- that reasonably correspond to solid transducer layers as claimed.

We also agree with the examiner that Harada discloses an actuator attached to the substrate distal to the transducer as claimed essentially for the reasons noted by the examiner. Significantly, the scope and breadth of the term "actuator" does not preclude the "positioning actuator" 7 of Harada along with associated structure attached to and including arm 5. Furthermore, we agree with the examiner that the term "attached" does not require direct contact, but can include indirect contact via intervening structures [see answer, page 7]. With this interpretation, the limitation is fully met by Harada.

Regarding claim 20, appellant first argues that the examiner failed to identify the structure in the appellant's specification that corresponds to the means-plus-function limitation "actuation means for positioning said transducer" [brief, page 20]. Appellants also argue that Harada does not teach "actuation means attached to said substrate distal to transducer" as claimed [id.]. The examiner responds by noting that although no actuator is shown adjacent the transducer in Fig. 2 of Harada, the actuator must nevertheless be distally located from the transducer [answer, page 19]. In addition, the examiner indicates that structure corresponding to means-plus-function limitations can include prior art described in the specification [answer, page 19]. Appellant responds by noting,

[4] The examiner also refers to these layers in connection with claims 21 and 27 (noting that the "nearly-vertical" pole tip layers of head 1 perform the transducing function). See answer, pages 7, 8, 24, and 25].

among other things, that the structure in appellant's specification that corresponds to the "actuation means for positioning said transducer" is clearly specified on Page 3 of the brief [reply brief, page 9].

We will not sustain the examiner's rejection of claims 20 and 27. In short, we disagree with the examiner that the actuator briefly noted in ¶ 0004 of appellant's specification corresponds to the means-plus-function limitation of claim 20. Means-plus-function claim language must be construed in accordance with 35 U.S.C. § 112, ¶ 6 by "look[ing] to the specification and interpret[ing] that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure." In re Donaldson Co., Inc., 16 F.3d 1189, 1193, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994).

Appellant has specifically identified the structure in the specification that corresponds to the means-plus-function limitation [brief, page 3, lines 14-18; reply brief, page 9]. Although the examiner correctly cites Clearstream Wastewater Systems, Inc. v. Hydro-Action, Inc., 206 F.3d 1440, 54 USPQ2d 1185 (Fed. Cir. 2000) for the proposition that admitted prior art structures can correspond to means-plus-function limitations in combination claims in certain situations, we conclude that such a situation is not present here. As appellant indicates, the Background section of appellant's specification merely briefly mentions a conventional actuator [see reply brief, page 8]. Significantly, the specification does not describe the conventional actuator's structure at all, apart

from its ability to position a pair of arms or load beams adjacent each spinning disk [specification, ¶ 0004]. At best, this passage merely refers to a conventional actuator in passing without describing it, let alone characterizing the actuator as a VCM actuator as the examiner alleges on page 19 of the answer.

On this record, we find that appellant's mere brief mention of a conventional actuator – without more – fails to encompass conventional actuators in the means-plus-function limitation of claim 20.[5] Therefore, we will interpret this means-plus-function limitation as being limited to the corresponding structure in the specification identified by appellant [see brief, page 3, lines 14-18; reply brief, page 9] and its equivalents. See Donaldson, 16 F.3d at 1193, 29 USPQ2d at 1848.

With this interpretation, we conclude that Harada does not disclose the structure corresponding to the means-plus-function limitation of independent claim 20. Accordingly, we will not sustain the examiner's rejection of that claim. Since we do not sustain the examiner's rejection of independent claim 20, we likewise do not sustain the examiner's rejection of dependent claim 27.

Regarding claim 7, appellant argues that the slider 2 of Harada does not have a media-facing surface, but is instead covered by magnetic head 1 [brief, page 20; reply brief, page 9]. The examiner responds that although magnetic head 1 covers the surface of the slider, the slider nevertheless has a surface parallel to and facing disk 6 [answer, page 21].

[5] See NCR Corp. v. Palm, Inc., 217 F. Supp. 2d 491, 515-17 (Del. 2002) (holding that corresponding structure to means-plus-function limitation did not include an admitted prior art structure that was mentioned only in passing in the specification).

We agree with the examiner. The lowermost surface of the slider 2 is closest to the media and reasonably constitutes a media-facing surface notwithstanding the presence of magnetic head 1. Significantly, the claim language does not require the face to be exposed as the examiner indicates [see answer, page 23]. In short, a surface can "face" another surface despite the presence of an intervening structure between the surfaces. The examiner's interpretation is reasonable and the rejection of claim 7 is therefore sustained.

Regarding claim 8, appellant argues that Harada in Fig. 5 shows that gimbal 3 is aligned substantially with a plane, but slider 2 is not intersected by that plane [brief, page 21]. The examiner responds that the claim is met since, among other things, the top of slider 2 lies in a common plane with the gimbal arms on both sides of the slider, and the actuator must lie substantially within this plane [answer, page 21].

We will sustain the examiner's rejection of claim 8 essentially for the reasons noted by the examiner. In short, the scope and breadth of the claim language did not preclude the examiner's interpretation of Harada – an interpretation that we find reasonable. The rejection is therefore sustained.

Regarding claim 9, appellant first argues that Harada does not anticipate the claim since slider 2 does not allegedly have a media-facing surface [brief, page 21; reply brief, page 10]. Appellant further notes that a protrusion cannot rise from a non-existent media-facing surface [brief, page 21]. The examiner reiterates that Harada's slider 2 has a media-facing surface for the reasons

stated previously. The examiner further notes that a "rigid body" as claimed does not preclude two integral members that are directly contacting and fixed to each other [answer, page 22].

We will sustain the examiner's rejection of claim 9. We agree with the examiner that the scope and breadth of the limitation "rigid body" did not preclude the slider 2 of Harada. In addition, we agree with the examiner that the slider has a media-facing surface as we noted previously. Moreover, we find that the examiner's interpretation of the claimed "protrusion" as being fully met by elements in Harada associated with numeral 21 that rise through slider 2 and form portion 4 on the back surface of slider 2 is reasonable [see answer, page 7]. We add that even the thickness of layer 4 itself reasonably constitutes a "protrusion" that extends away from the slider's media-facing surface. Because all limitations of claim 9 are fully met by Harada, the examiner's rejection is therefore sustained.

Regarding claims 21 and 24, the examiner notes that the transducer layers (i.e., the "nearly vertical" pole tip layers) of Harada are in a plane that is substantially perpendicular to the plane where flexible elements 3 lie [answer, pages 7 and 8]. Appellant argues that Harada is not enabled to teach flexible elements since it is allegedly impossible to reconcile Figs. 2 and 3 of Harada with Figs. 4 and 5 of the reference [brief, page 22]. Appellant further argues that Harada fails to teach the skilled artisan how to make the transducer layers of head 1 [id.]. The examiner responds that Harada need not show every detail to

be enabling. The examiner further contrasts the embodiment of Fig. 9 of Harada (head and associated layers oriented perpendicular to disk) with other embodiments that dispose the head parallel to the disk [answer, page 24 and 25]. Appellant argues that the embodiment of Fig. 9 is "even more nonenabled that the other figures of Harada" due to, among other things, the reference failing to teach how to overcome the strain between metal wirings 4 and head 1 due to the difference in their respective thermal expansion coefficients during bonding [reply brief, page 12].

We will sustain the examiner's rejection of claims 21 and 24 essentially for the reasons stated by the examiner. As we noted previously, we find appellant's arguments regarding lack of enablement of Harada's disclosure unpersuasive. We agree with the examiner that the substantially vertical orientation of the pole tip layers of head 1 of Harada (i.e., the transducer layers) as shown in Fig. 3 fully meets the claim limitation calling for the orientation of the transducer layers. Furthermore, appellant has not persuasively rebutted the examiner's interpretation of Fig. 9 of Harada apart from contending that the embodiment is not enabled. We find appellant's arguments in this regard merely speculative and therefore unpersuasive. Even assuming, for the sake of argument, that some strain will occur between the metal wirings and the head during bonding as appellant contends, appellant has provided no evidence on this record that the

apparatus of Fig. 9 in Harada is totally incapable of operating. In short, appellant has failed to overcome the presumption that Fig. 9 of Harada is enabled.[6]

We next consider the rejection of claims 2, 4, 11, 12, 14, 17, 19, and 24 under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of IBM. In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the examiner to establish a factual basis to support the legal conclusion of obviousness. See In re Fine, 837 F.2d 1071, 1073, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In so doing, the examiner is expected to make the factual determinations set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). The examiner must articulate reasons for the examiner's decision. In re Lee, 277 F.3d 1338, 1342, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002). In particular, the examiner must show that there is a teaching, motivation, or suggestion of a motivation to combine references relied on as evidence of obviousness. Id. at 1343, 61 USPQ2d at 1433-34. The examiner cannot simply reach conclusions based on the examiner's own understanding or experience - or on his or her assessment of what would be basic knowledge or common sense. Rather, the examiner must point to some concrete evidence in the record in support of these findings. In re Zurko, 258 F.3d 1379, 1386, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Thus the examiner must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the examiner's conclusion. However, a

[6] See pages 5 and 6, supra, of this opinion.

suggestion, teaching, or motivation to combine the relevant prior art teachings does not have to be found explicitly in the prior art, as the teaching, motivation, or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. In re Kahn, 441 F.3d 977, 987-88, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) citing In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1316-17 (Fed. Cir. 2000). See also In re Thrift, 298 F. 3d 1357, 1363, 63 USPQ2d 2002, 2008 (Fed. Cir. 2002). These showings by the examiner are an essential part of complying with the burden of presenting a prima facie case of obviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). If that burden is met, the burden then shifts to the applicant to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See Id.; In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976).

The examiner's rejection essentially finds that Harada teaches every claimed feature except for the actuator to include a layer or layers of piezoelectric material [answer, page 9]. The examiner, however, indicates that IBM discloses

using a piezoelectric actuator in an analogous disk drive application. The examiner finds that it would have been obvious to one of ordinary skill in the art at the time of the invention to use a piezoelectric actuator in lieu of the conventional rotary actuator of Harada to reduce access time, provide shock resistance, and reduce volume [answer, pages 9 and 10].

Appellant argues first that the disclosure of IBM is not enabled. Specifically, appellant contends that due to an "inherent conflict" between piezoelectric actuators A and B caused by the apparent need for each actuator's surrounding structure to be free to move, an "unknown and unpredictable amount of actuation to the head" would allegedly result [brief, page 28; reply brief, page 16]. Appellant also contends that IBM's system would "likely lead[ ] to intolerable errors" due to errors or inaccuracies in the long stroke actuator being multiplied by a factor of 1000 [id.]. Also, appellant argues that it is unclear how the limited long stroke actuator in IBM would allow the disk drive in Fig. 2 to be fabricated. In this regard, appellant notes that it is unclear how the head and suspension that interact with the inner zone could be moved beyond the disk's circumference during fabrication [brief, pages 28 and 29]. In addition, appellant contends that IBM fails to disclose how to write on and read from other major disk surfaces. In this regard, appellant contends that "at least an additional pair of heads and suspensions would be needed for this essential feature of a modern disk drive...." [brief, page 29].

The examiner responds that the disclosure of IBM is enabled and notes that a variety of fabrication methods of the IBM system are possible that would not entail undue experimentation, including, among other things, (1) building the piezoelectric actuators on the base of the drive, (2) placing the disk over a spindle, and (3) attaching the arms to the pivot structure that rises over the respective disk [answer, page 35]. The examiner also provides a detailed explanation of the operation of the IBM system [answer, pages 35-37].

We agree with the examiner that the disclosure of IBM is enabled. As we noted previously in connection with appellant's allegations of non-enablement of the base reference to Harada, appellant must provide evidence to overcome the reference's presumption of enablement. Amgen, Inc. v. Hoechst Marion Roussel, Inc., 314 F.3d 1313, 1355, 65 USPQ2d 1385, 1416 (Fed. Cir. 2003). Apart from mere speculation, appellant has offered no persuasive evidence overcoming this presumption. Moreover, we find persuasive the examiner's thorough and cogent analysis of the actuator's operation in IBM on pages 35 through the first paragraph of page 37 of the answer. As the examiner indicates, the skilled artisan would readily understand how to make or use the apparatus of IBM without undue experimentation.

Appellant also argues that the skilled artisan would not have modified Harada with the teachings of IBM since (1) the IBM system allegedly requires an additional drive for the same amount of storage due to the failure to provide for storage on both sides of the disk, (2) bending of actuator's thin and fragile arms

would weaken the arms over time, and (3) the combination of large errors despite limited actuation would have allegedly dissuaded the skilled artisan from employing the IBM system in a disk drive [brief, page 30].

We agree with the examiner that there is ample evidence on this record to motivate the skilled artisan to combine IBM with Harada. We are unpersuaded by appellant's assertions regarding why the skilled artisan would not have combined the Harada and IBM references since, among other things, the assertions are speculative without concrete evidentiary support. On the contrary, we find ample evidence on this record that would have reasonably suggested to the skilled artisan the advantages of utilizing a piezoelectric actuator as taught by IBM in the system of Harada essentially for the reasons stated by the examiner.

Regarding claim 11, appellant argues that the prior art does not teach nor suggest (1) "a wafer substrate piece," and (2) a flexible element connecting the rigid body and the actuator as claimed [brief, page 32]. We find that the collective teachings of the prior art amply disclose these limitations, particularly noting the integral structural relationship of Harada's slider 2 and gimbal 3 as shown in Figs. 3-6. Furthermore, Harada notes that the gimbal (flexible element) is shaped by etching the slider by utilizing an etching stop layer buried in a silicon substrate [Harada, ¶ 0035]. See also Harada, ¶ 0027 (noting that the slider and gimbal may have an integral structure formed from a silicon substrate). Moreover, we find that the skilled artisan would have reasonably relied on the teachings of IBM to utilize an electrostrictive actuator in lieu of the rotary actuator

of Harada essentially for the reasons stated by the examiner. Therefore, because the collective teachings of Harada and IBM teach all limitations of claim 11, we will sustain the examiner's obviousness rejection of that claim.

Regarding claims 2-4, 12, and 24 appellant argues that it is unclear whether IBM's piezoelectric elements include layers [brief, pages 31-34; reply brief, page 17]. The examiner responds that piezoelectric layers must have at least one layer of piezoelectric material in conjunction with associated electrode layers to create the requisite electric field in order to function [answer, page 38; see also answer, page 45].

We agree with the examiner. Significantly, apart from mere speculation, appellant has provided no evidence to rebut the examiner's findings regarding the necessary existence of layers associated with piezoelectric actuators that enable such actuators to function. Not only do we find the examiner's technical reasoning persuasive, it is unrebutted. Accordingly, we will sustain the examiner's rejection of claims 2-4, 12, 13, and 24.

Regarding claim 14, we disagree with appellant's assertion that slider 2 is not intersected by the plane containing gimbal 3. Referring to Fig. 4, we conclude that slider and gimbal 3 are coplanar with respect to at least one surface. Such a structure fully meets the claim which merely calls for the rigid body and actuator to be intersected by the plane. The limitation is fully met by Harada and the examiner's obviousness rejection of claim 14 is therefore sustained.

We will also sustain the examiner's rejection claim 17 for the same reasons we noted previously in connection with claim 9.[7] Rather than repeat our reasoning regarding this limitation, we incorporate that discussion by reference.

Regarding claim 19, appellant argues that IBM fails to teach a means for providing electrical voltage to the actuator [brief, page 34]. However, both Harada and IBM disclose electrical actuators. Although a source of voltage may not be expressly shown, it must nevertheless be present in either system for the electrical actuator to function at all. Because a voltage source is implicitly present in the cited prior art, the limitation is fully met. Accordingly, the examiner's rejection is sustained.

We next consider the examiner's rejection of claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of Endo. The examiner's rejection essentially finds that Harada teaches every claimed feature except for the flexures of the suspension to be substantially aligned with a center of mass of the rigid body [answer, page 10]. The examiner cites Endo as teaching such a feature and finds that it would have been obvious to one of ordinary skill in the art at the time of the invention to provide such a feature in Harada to (1) shorten the distance against the surface of the magnetic disk, and (2) stably support the slider [answer, pages 10 and 11].

Appellant argues that the combination of references is improper since, among other things, references teach opposite approaches that are irreconcilable

[7] See page 12, supra, of this opinion.

[brief, page 35; reply brief, page 18]. In this regard, appellant notes that Endo involves a suspension that is fitted into a groove of the slider, but Harada's gimbals are located on the side of the slider [brief, page 35]. The examiner argues that Endo's teaching can be accomplished in Harada by merely offsetting the integral flexures on the side of the slider [answer, page 44]. Appellant responds that such a modification is problematic since, among other things, Harada does not teach how to lower the gimbals. Appellant further notes that the reference fails to teach how to connect the electric wiring 4 through the back of the slider if the gimbals were shifted lower as proposed by the examiner [reply brief, page 18].

We will not sustain the examiner's rejection of claim 6. We agree with the appellant that the examiner's proposed modification of Harada is problematic essentially for the reasons noted by appellant. Although the examiner contends that offsetting the gimbals in Harada is readily accomplishable, the examiner has not persuasively rebutted appellant's arguments to the contrary. Nor can we find any reasonable teaching on this record of how such offsetting could be accomplished to align the flexible elements of Harada with the rigid body's center of gravity apart from the examiner's conclusory statements. In short, we disagree with the examiner that the skilled artisan would be motivated to make such a modification to Harada. Accordingly, we will not sustain the examiner's rejection of claim 6.

We next consider the examiner's rejection of claim 18 under 35 U.S.C. § 103(a) as being unpatentable over Harada in view of IBM and further in view of Fukuoka. The examiner's rejection essentially finds that Harada and IBM teach every claimed feature except for the piezoelectric actuator to contain silicon [answer, page 11]. The examiner cites Fukuoka as disclosing such a feature and finds that it would have been obvious to one of ordinary skill in the art at the time of the invention to provide such a feature in the Harada/IBM actuator to prevent electrode deformation [answer, pages 11-12]. Appellant argues that because IBM does not mention an electrode or where such an electrode would be located, it is at best unclear whether electrode deformation would be a problem [brief, page 36].

We will sustain the examiner's rejection of claim 18. As we indicated previously, we agree with the examiner's analysis regarding the existence of layers -- including electrode layers -- in a piezoelectric actuator. See page 21, supra, of this opinion. Furthermore, we find that the skilled artisan would have reasonably relied on the teachings of Fukuoka of using a silicon-containing material in a piezoelectric actuator for the reasons noted by the examiner. Because appellant's arguments do not persuasively rebut the examiner's prima facie case of obviousness, we will sustain the examiner's rejection of claim 18.

We next consider the examiner's rejection of claims 21 and 27 under 35 U.S.C. § 102(b) as being anticipated by Tokuyama.[8] The examiner has indicated how the claimed invention is deemed to be fully met by the disclosure of Tokuyama [answer, pages 12, 13, 27, and 28]. Regarding independent claim 20, appellant argues that actuator 12 in Tokuyama does not meet the claimed "actuation means for positioning said transducer." In this regard, appellant notes that Tokuyama's actuator is a conventional rotary actuator and thus fails to anticipate the structure disclosed in appellant's specification that corresponds to the "actuation means" [brief, pages 24-25; reply brief, page 13]. The examiner argues that, among other things, Tokuyama teaches mounting a piezoelectric actuator in synthetic layer 32 [answer, page 30]. Additionally, the examiner emphasizes that the actuator of Tokuyama is attached to the substrate as claimed since (1) such actuator attachment is necessary for the tranducer's movement, and (2) the term "attached" does not require a direct connection [answer, page 28]. Appellant responds that even if the synthetic resin film with piezoelectric element built therein in Tokuyama is a "substrate," the piezoelectric element built therein is not attached to the substrate, but part of the "substrate" [reply brief, page 13].

[8] Although the examiner did not expressly include independent claims 1 and 20 in this rejection, claims 21 and 27 nevertheless depend from claims 1 and 20 respectively and therefore include each and every element recited in claims 1 and 20. Although the examiner's statement of the rejection is technically erroneous, we nevertheless conclude that such error is harmless. Accordingly, we will presume that the examiner's rejection includes independent claims 1 and 20 for purposes of this opinion.

Appellant also argues that Tokuyama fails to disclose (1) a plurality of flexible elements, (2) a substrate shaped as a rigid body, and (3) a plurality of solid transducer layers as claimed [brief, page 25]. Regarding appellant's arguments (1) and (2), the examiner responds that substrate 30 (unflexed portion of slider) is shaped as a rigid body, and the plural divided portions of substrate 30 that flex constitute the claimed plurality of flexible elements [answer, page 28]. Regarding appellant's third argument, the examiner argues that Tokuyama infers a conventional inductive thin film magnetic head, but then assumes that Tokuyama's heads are "ring-type" heads that, according to the examiner, "must have two pole layers and a fringing gap" [answer, page 31]. Appellant responds that nothing in Tokuyama supports the examiner's assertion, but such statements rather stem from the examiner's personal knowledge [reply brief, pages 13 and 14]. In light of such statements, appellant requests that the examiner provide a supporting affidavit under 37 CFR 1.104(d)(2) [reply brief, page 14].

The examiner also argues that the transducer shown in Fig. 34 of Tokuyama that utilizes coil layer 200 inherently requires multiple layers "for the magnetic flux to close back on itself" [answer, page 32]. Appellant responds that coil layer 200 of Tokuyama in the embodiment of Fig. 34 is not a solid transducer layer, but a wire wound in coil shape associated with a single integral magnetic core 210.

We will not sustain the examiner's anticipation rejection of claims 1, 20, 21, and 27 based on Tokuyama. We disagree with the examiner that Tokuyama

expressly or inherently discloses an electromagnetic transducer including a plurality of solid transducer layers as claimed in independent claims. We agree with appellant that nothing in Tokuyama supports the examiner's assertion that Tokuyama's heads are "ring-type" heads that must have two pole layers and a fringing gap or that the coil layer 200 inherently requires multiple layers. In short, the examiner has failed to provide evidence to establish that Tokuyama necessarily contains a plurality of solid transducer layers as claimed. Accordingly, the examiner's anticipation rejection of claims 1, 20, 21, and 27 based on Tokuyama is reversed.

In summary, we have sustained the examiner's rejection of claims 1, 2, 4, 7-12, 14, 17-19, 21, and 24. We have not, however, sustained the examiner's rejection with respect to claims 6, 20, and 27. Lastly, we hold that the disclosure of Tokuyama does not fully meet the invention set forth in claims 1, 20, 21, and 27. Therefore, the decision of the examiner rejecting claims 1, 2, 4, 6-12, 14, 17-21, 24, and 27 is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

ERROL A. KRASS)
Administrative Patent Judge)
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JERRY SMITH) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
) INTERFERENCES
)
)
JEAN R. HOMERE)
Administrative Patent Judge)

JS/jaj

MARK A LAUER
6601 KOLL CENTER PARKWAY
SUITE 245
PLEASANTON CA 94566